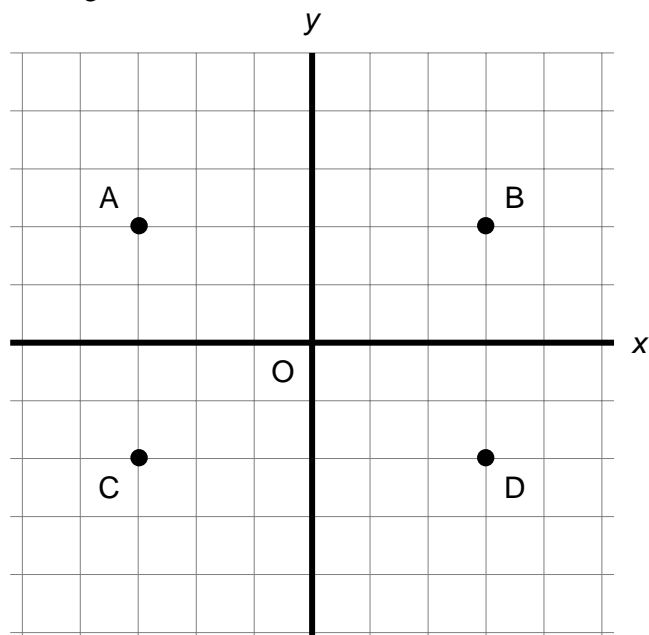


Worksheet 14.4: Composition of Reflections

As we read in section 14.4 a composition of transformations is two transformations where the second transformation is performed on the image of the first transformation. The symbology used for a composition of transformations is $S \circ T$ which can be read "S after T" or "T followed By S." Combining this notation with our arrow notation we can write $S \circ T: P \rightarrow P''$. This notation indicates that the composition of transformations maps P onto P''.

Complete the following. R_x and R_y indicate reflections in the x- and y-axes, and H_0 indicates a half-turn about the origin.



1. $R_x \circ R_y: A \rightarrow$ _____
2. $R_x \circ R_y: D \rightarrow$ _____
3. $H_0 \circ R_y: B \rightarrow$ _____
4. $R_y \circ H_0: B \rightarrow$ _____
5. $H_0 \circ H_0: A \rightarrow$ _____
6. $R_y \circ R_y: C \rightarrow$ _____

S and T are translations. Let $S:(x, y) \rightarrow (x + 1, y + 4)$ and $T:(x, y) \rightarrow (x + 3, y - 1)$. Given $A(4, 1)$, $B(1, 5)$, and $C(0, 1)$ answer the following questions.

7. Find the coordinates of A'', B'', and C'' under $S \circ T$.

8. Find the coordinates of A'' , B'' , and C'' under $T \circ S$.

9. Is $S \circ T$ equal to $T \circ S$?

10. $S \circ T(x, y) \rightarrow (\rule{1.5cm}{0.4pt}, \rule{1.5cm}{0.4pt})$.

11. Reflect $\triangle ABC$ in the x -axis and then its image, $\triangle A'B'C'$ in the line $y = -x$. Label the coordinates of each triangle. What single rotation would map $\triangle ABC$ onto $\triangle A''B''C''$?

